(19) World Intellectual Property Organization International Bureau





(43) International Publication Date 3 April 2003 (03.04.2003)

PCT

(10) International Publication Number WO 03/027431 A3

(51) International Patent Classification⁷: E21B 43/26, C09K 3/00

(21) International Application Number: PCT/US02/30202

(22) International Filing Date:

24 September 2002 (24.09.2002)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

60/325,071 60/340,224 26 September 2001 (26.09.2001) US 7 December 2001 (07.12.2001) US

(71) Applicant and

(72) Inventor: COOKE, Claude, E., Jr. [US/US]; 197 Lake View Circle, Montgomery, TX 77356 (US).

(74) Agent: COOKE, Claude, E., Jr.; Baker Botts L.L.P., 910 Louisiana Street, One Shell Plaza, Houston, TX 77002 (US).

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW.

(84) Designated States (regional): European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR).

Declaration under Rule 4.17:

as to the identity of the inventor (Pule 4.17(i)) for all designations

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments
- (88) Date of publication of the international search report:

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: METHOD AND MATERIALS FOR HYDRAULIC FRACTURING OF WELLS

(57) Abstract: Hydraulic fracturing of wells by injecting a degradable polymer phase as a fracturing fluid is provided. Composition and degree of polymerization of the degradable polymer and the selection of additives may be varied to adjust the viscosity, degradation time and other properties of the fracturing fluid. Viscous degradable fluid or pellets of degradable polymer may be placed in a wellbore as an internal phase in a low viscosity carrier fluid. A polymer-continuous liquid phase may be formed at a selected location in the wellbore, usually near perforations, before the polymer phase is pressured into a formation to form a hydraulic fracture.

03/027431 A3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/30202

A. CLASSIFICATION OF SUBJECT MATTER IPC(7) : E21B 43/26: C09K 3/00			
US CL: 166/308; 507/209, 219, 221, 922, 924 According to International Patent Classification (IPC) or to both national classification and IPC			
B. FIELDS SEARCHED			
Minimum documentation searched (classification system followed by classification symbols) U.S.: 166/308; 507/209, 219, 221, 922, 924			
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched			
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) EAST			
C. DOCUMENTS CONSIDERED TO BE RELEVANT			
Category *	Citation of document, with indication, where	appropriate, of the relevant passages	Relevant to claim No.
х	US 5,699,860 A (GRUNDMANN) 23 December 1	997 (23.12.1997), Example 1 and	24, 25, 30-32
x	column 4, lines 22-27. US 5,439,059 A (HARRIS et al) 08 August 1995 (08.08.1995), column 6, lines 39-45. 1, 2, 4, 5, 7, 9, 11, 17, 21-23		1, 2, 4, 5, 7, 9, 11, 16,
x	US 4, 417, 989 A (HUNTER) 29 November 1983 (29.11.1983), column 6, lines 36-47.		24, 25, 30
A	US 4,715,967 A (BELLIS et al) 29 December 1987 (29.12.1987) see claims.		· 1-23
Further	documents are listed in the continuation of Box C.	See patent family annex.	
• s	pecial categories of cited documents:	"T" inter document published after the inter	
	defining the general state of the art which is not considered to be lar relevance	date and not in conflict with the applica principle or theory underlying the invest	
"E" cartier ap	plication or patent published on or after the international filing date	"X" document o, particular relevance; the considered novel or cannot be consider when the document is taken alone	
"L" document establish (specified)	which may throw doubts on priority claim(s) or which is cited to the publication date of another citation or other special reason (as	'Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination	
	referring to an oral disclosure, use, exhibition or other means	being obvious so a person skilled in the	an i
priority date claimed		"A" document member of the same patent fi	
Date of the actual completion of the international search		Date of mailing of the international search report 07 APR 2003	
10 March 2003 (10.03.2003)			
LABITE SID INTERING STATES OF THE POLICE		Authorized officer	\boldsymbol{X}
Commissioner of Patents and Trademarks Box PCT		Philip C Tucker	~4 I
Box PCT Washington, D.C. 2023)			im I
		Telephone No. 703-308-0651	<i>\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\</i>